

## CLAIMS

What is claimed is:

- 1    1.    A method, comprising:  
2            periodically capturing data from a tunable optical device during operation of  
3    the tunable optical device; and  
4            streaming the data from the tunable optical device.
- 1    2.    The method of claim 1 wherein streaming the data comprises outputting a  
2    plurality of data frames from a serial interface coupled to the tunable optical device,  
3    wherein each data frame of the plurality of data frames includes data captured from  
4    the tunable optical device at a particular time.
- 1    3.    The method of claim 2, further comprising formatting the data into the plurality  
2    of data frames.
- 1    4.    The method of claim 2 wherein each data frame includes a frame start code,  
2    an index number, a standard data section, and a device specific data section.
- 1    5.    The method of claim 4 wherein each data frame includes a checksum.
- 1    6.    The method of claim 1, further comprising buffering the captured data at the  
2    tunable optical device prior to streaming the data from the tunable optical device.

1 7. The method of claim 1, further comprising receiving a user injected signal at  
2 the tunable optical device to artificially change an operating factor of the tunable  
3 optical device.

1 8. The method of claim 7, further comprising routing the user injected signal to a  
2 controller of the tunable optical device.

1 9. The method of claim 1, further comprising receiving the data at a data  
2 acquisition unit communicatively coupled to the tunable device.

1 10. The method of claim 9, further comprising storing the data at a storage device  
2 communicatively coupled to the data acquisition unit.

1 11. An apparatus, comprising:  
2 a tunable optical device; and  
3 a controller coupled to the tunable optical device, the controller including a  
4 serial interface coupled to a processor, the controller to capture a plurality of sets of  
5 real-time data from the tunable optical device during operation of the tunable optical  
6 device, the controller to stream the plurality of sets of real-time data from the tunable  
7 optical device.

1 12. The apparatus of claim 11 wherein each set of the plurality of sets real-time  
2 data includes a plurality of data points regarding the tunable optical device captured  
3 at a unique time.

1 13. The apparatus of claim 11 wherein the serial interface comprises one of an  
2 SPI (Serial Peripheral Interface), a UART (Universal Asynchronous  
3 Receiver/Transmitter), an I2C (Inter-Integrated Circuit), a USB (Universal Serial Bus)  
4 port, or a SCSI (Small Computer System Interface).

1 14. The apparatus of claim 11 wherein the serial interface is coupled to a select  
2 pin, a data clock pin, and a data pin of the controller, the select pin to signal a device  
3 communicatively coupled to the serial interface to prepare to receive the plurality of  
4 sets of real-time data, the data clock pin to indicate the data rate that the plurality of  
5 sets of real-time data are to be outputted from the serial interface, the data pin to  
6 output the plurality of sets of real-time data from the tunable optical device.

1 15. The apparatus of claim 11, further comprising a buffer coupled to the  
2 controller to temporarily store at least a portion of the plurality of sets of real-time  
3 data.

1 16. The apparatus of claim 11, further comprising an analog-to-digital (ADC)  
2 coupled to the controller to convert at least a portion of the plurality of sets of real-  
3 time data from analog to digital.

1 17. The apparatus of claim 11 wherein the plurality of sets of real-time data are  
2 captured at a periodic rate based on a processing speed of the processor.

1 18. A system, comprising:  
2 a tunable optical device; and  
3 a controller coupled to the tunable optical device, the controller comprising:  
4 a processor; and  
5 at least one flash device coupled to the processor, the at least one  
6 flash device including firmware instructions which when executed by the  
7 processor perform operations comprising:  
8 capturing a first plurality of data points from the tunable optical  
9 device at a first time; and  
10 streaming the first plurality of data points from the tunable  
11 optical device.

1 19. The system of claim 18 wherein execution of the firmware instructions further  
2 perform operations comprising forming the first plurality of data points into a first  
3 data frame.

1 20. The system of claim 19 wherein execution of the firmware instructions further  
2 perform operations comprising:  
3 capturing a second plurality of data points from the tunable optical device at a  
4 second time;

5           forming the second plurality of data points into a second data frame; and  
6           streaming the second plurality of data points from the tunable optical device.

1   21.    A method, comprising:

2           receiving a data stream from a tunable optical device at a data acquisition  
3   unit, wherein the data stream includes data periodically captured from the tunable  
4   optical device; and  
5           storing the data in a storage device communicatively coupled to the data  
6   acquisition unit.

1   22.    The method of claim 21, further comprising receiving a select signal at the  
2   data acquisition unit to indicate to the data acquisition unit to prepare to receive the  
3   data stream.

1   23.    The method of claim 21 wherein receiving the data stream comprises  
2   receiving a plurality of data frames at a serial interface coupled to the data  
3   acquisition unit, wherein each data frame of the plurality of data frames includes a  
4   plurality of data points captured from the tunable optical device at a particular time.

1   24.    The method of claim 23 wherein each data frame of the plurality of data  
2   frames includes a frame start code, an index number, a standard data section, and a  
3   device specific data section.

1 25. The method of claim 24, further comprising synchronizing the receiving of the  
2 plurality of data frames through the index number of at least one data frame of the  
3 plurality of data frames.

1 26. The method of claim 21, further comprising sending a user injected signal  
2 from the data acquisition unit to the tunable optical device, wherein the user injected  
3 signal to artificially change an operating factor of the tunable optical device.

1 27. An article of manufacture comprising:  
2 a machine-readable medium including a plurality of instructions which when  
3 executed perform operations comprising:  
4 capturing real-time data from a tunable optical device during operation of the  
5 tunable optical device;  
6 forming a plurality of data frames from the real-time data, each data frame of  
7 the plurality of data frames including at least one data point captured from the  
8 tunable optical device at a particular time; and  
9 streaming the plurality of data frames from the tunable optical device.

1 28. The article of manufacture of claim 27 wherein streaming the plurality of data  
2 frames comprises sending the plurality of data frames from a serial interface coupled  
3 to the tunable optical device.

1 29. The article of manufacture of claim 28 wherein execution of the plurality of  
2 instructions further perform operations comprising taking the at least one data point  
3 from a buffer coupled to the serial interface to form a data frame of the plurality of  
4 data frames.

1 30. The article of manufacture of claim 28 wherein execution of the plurality of  
2 instructions further perform operations comprising sending a select signal to a select  
3 line of the serial interface to signal a device communicatively coupled to the tunable  
4 optical device to prepare to receive streaming of the plurality of data frames.